

## Dr Clive Ponton

Senior Lecturer

**[School of Metallurgy and Materials \(/schools/metallurgy-materials/index.aspx\)](/schools/metallurgy-materials/index.aspx)**

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### About

Clive Ponton is a Senior Lecturer in the School of Metallurgy and Materials, and the School's Head of Quality Assurance, Third Year Undergraduate Tutor, and UG Research Project Coordinator.

He has published over 150 research papers in the field of metallurgy and materials science, and is a co-inventor on 6 patents (2 with Rolls-Royce plc), and has given conference presentations nationally and internationally (including invited talks) in Europe, USA and Japan.

His research at the University of Birmingham has been/is supported by various industrial companies (for fully funded confidential company research, or partial funding in support of EPSRC/TSB/EU research programmes etc.) such as Rolls-Royce, Morgan Materials, Sandvik; Government funding agencies such as the Civil Aircraft Research and Technology Demonstration (CARAD) programme, DTI (now TSB), EPSRC; other funding bodies such as the Royal Society, EICF, etc.

Clive is enthusiastic about teaching materials science (ceramics, metals and polymers) to both undergraduate and graduate students.

### Qualifications

- CEng, 1990
- MIMMM, 1990
- PhD and DIC, Materials Science, University of London and Imperial College, 1987
- BSc(Eng) and ARSM, Metallurgy & Materials, University London and Imperial College, 1983

### Biography

Clive Ponton graduated with a BSc(Eng) and ARSM in Metallurgy and Materials from Imperial College London in 1983.

He went on to do postgraduate research on the Mechanical Properties of Glass-Ceramics in the System  $\text{CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$  and in 1987 was awarded a PhD and DIC from Imperial College/University of London, as well as the 1987 Matthey Prize by the Department of Materials (Imperial College London) for the best PhD thesis. In 1987, he was also directly elected as a Member of the Institute of Ceramics (MICeram) [Institute of Ceramics now subsumed into IMMM].

Clive carried out postdoctoral research as an EPSRC Research Fellow for from 1987 to 1989, working on the development of new bioactive apatite-containing glass-ceramics.

In 1989, he was appointed as a Lecturer in Ceramic Engineering in the School of Metallurgy and Materials at the University of Birmingham.

In 1990, Clive was awarded the Pfeil Medal and Prize (co-awardee, Prof. RD Rawlings) for published work of particular merit in the field of ceramics, and also conferred Professional Membership of IOMMM (MIMMM) and Chartered Engineer (CEng) status.

In 1996, he was promoted to Senior Lecturer in the School of Metallurgy and Materials at the University of Birmingham.

### Teaching

#### Undergraduate Degree Programmes

- BEng Materials Science and Technology
- BEng Metallurgy
- MEng Materials Engineering
- BEng/MEng Materials Science and Engineering with Business Management
- BEng/MEng Materials Science and Energy Engineering
- BEng/MEng Mechanical and Materials Engineering
- BSc Sports and Materials Science
- BMedSci Biomedical Materials Science

#### Level H (Year 3) Modules

- Control of Microstructure
- High Toughness Ceramics

- Biomaterials
- Research Project
- Advanced Materials (Bio Med Sci)

### Level I (Year 2) Modules

- Functional and Ceramic Materials A: Energy and Communication
- Functional and Ceramic Materials B: Transport and Environment

### Level C (Year 1) Modules

- Mechanics and Materials in Sport

## Postgraduate supervision

To date all 25+ PhD students supervised/co-supervised by Clive have been awarded a PhD.

## Research

### RESEARCH ACTIVITY:

#### Nano- and micro-scale science and technology

- Aqueous corrosion of metals at high temperature and pressure (with Dr Brian J. Connolly)
- Oxide glaze formation during high temperature bearing wear (with Dr Phil Wood [Royal Society Industrial Fellow] and Prof. Hugh E. Evans)

#### Synthesis / colloidal processing of non-metallic and metallic nanoparticles

- Development of stable ceramic sols
- Electrophoretic deposition of ceramic nanoparticles

#### Fabrication of Micro- and Nano-Particulate-based structures

- Development of electrically conductive materials for electrophoretic deposition substrates

### RESEARCH THEMES

#### Nano- and micro-scale science and technology

- Complex oxides
- Oxidation of metals and non-oxide ceramics to produce oxide films
- Nanoscale phase distribution
- Core-shell composite nanoparticles
- Dispersed particle systems
- Engineered nanocomposites

#### Synthesis / colloidal processing of non-metallic and metallic nanoparticles

- Low temperature (<400°C; typically < 230°C) synthesis routes for producing non-metallic and metallic nanoparticles (5 nm - 500 nm 'mesoscale' size range) such as:
- Hydrothermal synthesis/processing
- Emulsion synthesis/processing
- Solvothermal synthesis/processing
- Other chemical synthesis/processing routes

#### Fabrication of Micro- and Nano-Particulate-based structures

- Electrophoretic deposition/infiltration of nanoparticles
- Pressure filtration of colloidal suspensions/slurries
- Micro/nano-engineered structures and composites
- Multi-phase structures
- Mixed inorganic/organic/metallic structures

## Publications

"Investigation into the wear behaviour of Tribaloy 400C during rotation as an unlubricated bearing at 600 °C" Wood, PD; Evans, HE; Ponton, CB. WEAR 269, [11-12], (2010), pp763-769.

"Oxidation of SiC powders for the preparation of SiC/mullite/alumina nanocomposites" He, JY and Ponton, CB. JOURNAL OF MATERIALS SCIENCE, 43, [12], (2008), pp4031-4041.

"Silica glass segregation in 3 wt% LiF-Doped hot-pressed Y2Si2O7" MacLaren, I; Schierholz, R; Trusty, PA; Ponton, CB. JOURNAL OF THE AMERICAN CERAMIC SOCIETY, 90, (2007), pp 3307-3310.

"A study of Sm-substituted SrM magnets sintered using hydrothermally synthesised powders" Wang, JF; Ponton, CB; Harris, IR. JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS, 298, [2], (2006), pp122-131.

"A study of Pr-substituted strontium hexaferrite by hydrothermal synthesis" Wang, JF; Ponton, CB; Harris, IR. JOURNAL OF ALLOYS AND COMPOUNDS, 403, [1-2], (2005), pp104-109.

"Control of the particle size and morphology of hydrothermally synthesised lead zirconate titanate powders" Su, B; Button, TW; Ponton, CB. JOURNAL OF MATERIALS SCIENCE, 39, [21], (2004), pp 6439-6447.

"A method of heat-treatment of near gamma-TiAl to enhance oxidation resistance by the formation of a Ti<sub>5</sub>Si<sub>3</sub> layer" Gray, S; Jacobs, MH; Ponton, CB, et al. MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING, 384, [1-2], (2004), pp77-82.

"Processing of Al<sub>2</sub>O<sub>3</sub>/SiC nanocomposites - part 1: aqueous colloidal processing" Timms, LA; Ponton, CB. JOURNAL OF THE EUROPEAN CERAMIC SOCIETY, 22, [9-10], (2002), pp1553-1567.

"Processing of Al<sub>2</sub>O<sub>3</sub>/SiC nanocomposites - part 2: green body formation and sintering" Timms, LA; Ponton, CB; Strangwood, M. JOURNAL OF THE EUROPEAN CERAMIC SOCIETY, 22, [9-10], (2002), pp1569-1586.

"Hydrothermal processing and characterisation of doped lanthanum chromite for use in SOFCs. Ovenstone, J; Chan, KC; Ponton, CB. JOURNAL OF MATERIALS SCIENCE, 37, [15], (2002), pp3315-3322.

"Ultrafine SrM particles with high coercivity by chemical coprecipitation" Wang, JF; Ponton, CB; Harris, IR. JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS, 242, [2], (2002), pp1464-1467

"Emulsion processing as a novel route to cordierite" Chan, KC; Ovenstone, J; Ponton, CB. JOURNAL OF MATERIALS SCIENCE, 37, [5], (2002), pp971-976.

